Biomedical Engineering

About Biomedical Engineering

Biomedical engineering is an interdisciplinary field in which the concepts, methods and techniques of engineering are applied to solving problems in biology and medicine. It applies quantitative, analytical and integrative methods from the molecular level to that of the whole organism to further our understanding of basic biological processes and to develop innovative approaches for the prevention, diagnosis and treatment of disease.

A student majoring in biomedical engineering will have the opportunity to participate in the world-class research activities of engineering and medical faculty in biomaterials, imaging, cardiovascular engineering, cell and tissue engineering, molecular cellular and systems engineering, neural engineering, regenerative engineering, and women's health technologies. All students in biomedical engineering are encouraged to join and be active in the Biomedical Engineering Society.

Mission Statement

The Department of Biomedical Engineering at Washington University in St. Louis (WashU BME) seeks to provide a first-class engineering education that prepares students for a variety of careers and a cutting-edge graduate program that advances knowledge and technology with the goal to improve human well-being.

Program Educational Objectives

Our overall educational objective is to prepare those receiving a bachelor's degree in biomedical engineering for a variety of career paths. To that end, our undergraduate curriculum is designed to provide technical proficiency and other professional skills so that our graduates will be able to:

- Pursue careers in the biomedical engineering industry or related fields
- Undertake advanced study (e.g., MS, PhD) in biomedical engineering or a related field
- Complete professional degrees (e.g., in medicine, dentistry, law)

Academic Programs

The Bachelor of Science in Biomedical Engineering (BS-BME) is designed to prepare graduates for the practice of engineering at a professional level. The BS in Biomedical Engineering program at Washington University in St. Louis is accredited by the Engineering Accreditation Commission of ABET, under the commission's General Criteria and Program Criteria for Biomedical Engineering.

The curriculum is structured around a basic core of 80 credits. In addition, a complementary set of courses totaling at least 40 credits completes the degree requirements.

To satisfy ABET requirements, all professional engineering curricula at the baccalaureate level must include the equivalent of one and one-half years of engineering topics, including engineering sciences and engineering design appropriate to biomedical engineering. The BS–BME degree at Washington University requires 47 credits of engineering topics. The basic core curriculum includes 32 engineering topics credits. Therefore, students pursuing a BS–BME degree will need 15 additional engineering topics credits beyond the basic core curriculum. They also may receive up to 6 credits of academic credit for a research or design project by BME 4000, BME 4001, BME 4002, or BME 4003 Independent Study. In addition, their course program must include sufficient laboratory experience to ensure competence in experimental design, data collection and data analysis. For more information regarding engineering topics credit requirements, please refer to the Undergraduate Curriculum webpage.

Bachelor's/Master's (BS/MS) Program in Engineering

This program provides undergraduate students the opportunity to earn a McKelvey master's degree by combining undergraduate and graduate studies in an integrated curriculum. Interested engineering students should discuss the program with their BME academic and Engineering Undergraduate Students Services advisors by the end of their junior year in order to best develop a plan for their senior year leading into their master's year. For McKelvey undergraduates, this program normally takes one additional year to complete. More information is available on the McKelvey undergraduate Bulletin page.

Double Majors

An option available to students majoring in biomedical engineering is the double major, which leads to a second professional BS degree in one of the other engineering disciplines in four years. A BME degree in combination with a professional degree in one of the traditional engineering disciplines can be expected to enhance employment options in industry. Depending upon the second major chosen, total unit requirements may range from 140 to 148 (or less if the student enters with advanced placement credits). Hence, some summer work may be necessary in order to complete a double major within four academic years. To determine the specific requirements to be satisfied for both degrees, students are urged to consult with an advisor in the second department as early as possible.

Premedical Preparation

Training in BME is also excellent preparation for various professional schools, particularly medical schools. Many students complete their premedical requirements while obtaining their BME degrees. Premedical preparation is not a major; rather, it allows students to fulfill the requirements needed for entry to medical school. Further information can be obtained by visiting the Premedicine webpage and by contacting the McKelvey School of Engineering's Health Professions Advisor, Jessica Allen (jessicaa@wustl.edu).

Cooperative Experience

Cooperative experience is available to upper-level students at numerous life science/technology companies both in the St. Louis area and nationwide. This experience is particularly valuable for students who wish to enter industry. However, since most companies ask that students spend the equivalent of one semester and a summer participating in these experiences, it may be difficult to complete the degree requirements in eight semesters, unless students enter with sufficient advanced placement credits and/or take summer courses.

Please visit our website for the most current and up-to-date information.

Phone:	314-935-7208
Website:	https://bme.wustl.edu/academics/undergraduate-programs/index.html